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CLAIMS

1. In a gas flow catalyst bed reactor assembly comprising an outer reaction vessel, an inner displacement cylinder, and an annular catalyst bed surrounding the displacement cylinder having a top half and a bottom half, the improvement comprising adding at least one baffle to the top half of the displacement cylinder to improve uniformity of fluid flow in the reaction vessel and across the catalyst bed.

2. The assembly of claim 1 wherein at least three baffles are added to the displacement cylinder.

3. The assembly of claim 1 wherein the annular catalyst bed is positioned at a distance from the displacement cylinder and wherein the at least one baffle extends into the reaction vessel for a distance limited by half distance from the displacement cylinder to the catalyst bed.

4. A process for improving fluid flow uniformity in a gas phase reactor comprising an outer reaction vessel, an inner displacement vessel having a top half and a bottom half and a reaction outer surface and an inert inner space, and an annular catalyst bed, the process comprising:

conducting fluid flow simulations using actual reactor conditions;

adding baffles on the outer reaction surface of the displacement vessel reactor to improve simulated fluid flow; and

adding the baffles to the displacement cylinder by entering the inner inert space of the cylinder and attaching the baffles to the reaction outer surface from the inner inert space.

5. The process of claim 4 wherein three baffles are added to the top half of the displacement cylinder and wherein said baffles are added without disassembly of the reactor or catalyst bed.

6. The process of claim 4 wherein the annular catalyst bed is at a certain distance from the displacement cylinder and wherein the baffles extend into the reaction vessel by a distance not greater than half the distance to the catalyst bed.

7. A process for improving catalyst life in an ethylbenzene dehydrogenation reactor where the reactor comprises

an outer reaction vessel having a height of at least fifty feet and an inside diameter of at least ten feet,

an annular catalyst bed extending through at least 70 percent of the reactor height, and

a displacement cylindrical vessel having an inside diameter of at least four feet, a height of at least 70% of the height of the reactor, an outer surface that is exposed to reaction in the reactor and an interior space that is isolated from any reaction in the reactor;

the process comprising

conducting fluid flow simulations using actual reactor conditions;

adding at least two baffles on the outer reaction surface of the displacement reactor to improve simulated fluid flow; and

adding the baffles to the displacement cylinder by entering the inner inert space of the cylinder and attaching the baffles to the reaction outer surface from the interior space.

8. The process of claim 7 wherein three baffles are added to the displacement cylinder at locations from about 60% to 90% of its height.